DETAILED ACTION

1. Receipt of Applicant's Amendment, filed 01/19/2010 is acknowledged.

Claims 18, and 44 have been amended, and none of the claims have been cancelled. Claims 1, 4-6, 8, 9, 15, 17, 18, 21, 25-27, 29, 30, 36 and 44-54 are pending in this office action.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1, 4, 5, 17-18, 21, 25-26, 45-52, and 56 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Obradovic et al.** (**Obradovic** hereinafter) (U.S. PG Pub No. 2002/0107581 A1), in view of **Bailey et al.** (**Bailey** hereinafter) (U.S. Patent No 6,820,076).

With respect to claim 1, **Obradovic** teaches **a method of storing information in a database to characterize attributes outputted by different classes of equipment, comprising:**

"storing in a first database table of a database memory device a plurality of attribute data records, wherein storing each attribute data record includes" as the

stress-test database may further include: a parsing table storing information relating to parsing of equipment-specific data received as a result of the stress test; said parsing table being associated with said equipment data entity to permit the equipment-specific data to be parsed into a more consistent format suitable for storage by said result data entity (**Obradovic** Paragraph 0031 and Figure 4).

Examiner interprets the storage of equipment specific data as storage of attribute data records. This equipment specific data is being stored on the memory device storing the database 40.

"storing in that record a first field identifying a class of equipment to which remaining fields in the record pertain" as the equipment table 520 may include the following information items or fields: equipment brand identifier, equipment brand name, equipment type identifier, equipment type description and other information items that are used to uniquely identify each piece of test and communication equipment (**Obradovic** Paragraph 0142, 0154).

Examiner interprets equipment brand and type as defining class of equipment. Further product table 410 storing product group and product line could also be interpreted as identifying a class of equipment.

"storing in that record a second field identifying an attribute whose value is outputted by the class of equipment identified by the first field of that record, wherein said attribute is a sensor measurement or operating parameter of said class of equipment identified by said first field" as the modules may also include sensors or other devices for measuring parameters of the module and the controller

may receive passive test measurement values from these sensors. In this way, a passive test of the modules may be performed independently of and simultaneous with the active testing. The results of the active test and the passive test measurement values for each of the modules are associated with the module and stored in a database (**Obradovic** Paragraph 0020).

These lines teach sensor measurements associated with the module/equipment is being stored in a database.

"storing in that record a third field specifying an ID which the class of equipment identified by the first field of that record assigns to the attribute identified by the second field of that record" as the equipment table 520 may include the following data entities: a equipment brand data entity 522, equipment type data entity 524 (optional particularly if the each brand has only one type), and the equipment usage data entity 526 each of which may include fields for ID, name and description (e.g. brand data entity 522 has an equipment brand ID which may be used as a key, equipment brand name and equipment brand description fields). Equipment brand entity 522 is associated with equipment type data entity 524 in order to positively identify the equipment (**Obradovic** Paragraph 0144, 0154).

Examiner interprets the field for equipment brand ID as the claimed ID of class of equipment.

"storing in a second database table that is a child table of the first database table a plurality of subordinate data records, wherein storing each subordinate data record includes" as the design of database 400 includes four main data entities:

the product table 410, the result table 430, the process table 450, and the equipment command & communication table 500. The major data associations relate the product table 410 to the result table 430; and the result table 430 to the process table 450; and the result table 430 to the equipment command & communication table 500 (**Obradovic** Paragraph 0137). The result table 430 may include the following data entities: result format data entity 432, result value data entity 434 and process-result value data entity 436. The result format data entity 432 stores result formatting and processing information such as result ID, result description, max decimal digits, sort order, etc. The result value 434 stores the actual test result value, a pass/fail result, test run ID, and result ID (**Obradovic** Paragraph 0148 and 0150).

Examiner interprets the result table as a second database table and a child table of table 500, which contains more fields.

"using the first field, second field, third field, fourth field and subordinate fields of an attribute data record, which in combination define a communications interface specification by a diagnostic apparatus to retrieve distinct attribute information from a distinct class of equipment" as the equipment command & communication table 500 permits the AMS controller 100 to send commands to, receive data from and otherwise communicate with various different types of test and communication equipment including the variety of test equipment 25 and the respective communication interface equipment (e.g. the communication server 55, Ethernet box 70, etc.). Each type of test and communication equipment may expect a different protocol, command, syntax, line rate, etc depending upon the equipment brand, model,

release, etc. One of the key advantages of the inventive system is the ability to easily communicate with any such equipment and the database 400 facilitates such communication by providing the appropriate protocols, syntax, commands, etc for the particular type of equipment being utilized (**Obradovic** Paragraph 0141).

These lines teach that appropriate commands, protocols are being sent by the controller to retrieve data from various different kinds of equipment by using communication equipments and the communication interface equipments.

Obradovic teaches the elements of claim 1 such as measurement values received form sensors on the test equipments, as noted above but does not explicitly discloses **"specifying conversion parameters that define a conversion of the value of the attribute identified in the second field into physical units of measurement" and "the subordinate fields including a min subordinate field that identifies a minimum physical value that can be output for the attribute, a max subordinate field that identifies a maximum physical value that can be output for the attribute, and a units subordinate field that identifies physical units in which physical values output for the attribute are expressed."**

However, **Bailey** discloses **"specifying conversion parameters that define a conversion of the value of the attribute identified in the second field into physical units of measurement"** as a part_id field may contain a unique number corresponding to each item. Thus the part_id field may be the primary key of this table. A part_number field may contain the number that the item is given from the manufacturer. *A unit_of_measure field identifies the unit of measure used to describe the item* (e.g.,

feet, inches, centimeters, degrees, etc.) (**Bailey** Col 13, Lines 29-48). The first seventeen items 204 have attribute values that are shown in English format and the remaining items 206 are shown in metric format. Selecting "Metric" button 200 will convert English format values to Metric, as shown in FIG. 9G. This is done by changing the conversion value in part_char table 22e from some English indicator like "in" for inches to a metric indication like "mm" for millimeters. Similarly, selecting the "English" button 202 will convert metric format values to English, as shown in FIG. 9H. This action would undo the previous change to the conversion field of part_char table 22e from "mm" to "in" (**Bailey** Col 24, Lines 10-21).

Therefore these lines teach storing units of measurement (such as feet, inches, degrees, etc) for different items/parts which could further be converted from English format to Metric format or vice versa.

"the subordinate fields including a min subordinate field that identifies a minimum value that can be output for the attribute, a max subordinate field that identifies a maximum value that can be output for the attribute," as for each attribute, an "Equal to" column 122, a "Minimum" column 124, and a "Maximum" column 126 are provided. More or fewer columns may be included as appropriate, such as "Greater than" and "Less than" columns for example. As shown in FIG. 8B, upon selection of an example cell 128 or arrow 130 in the "Equal to" 122 column, a pull-down selection menu 132 with all acceptable attribute values may appear, as illustrated in FIG. 8C. Pull-down selection menu 132 may be enabled using the char_valid_values field in keyword_char table 22c. Each char_valid_value cell contains a list of all valid

attribute values (e.g., 1.000, 2.000, etc.) for the corresponding attribute (e.g., shape) (**Bailey** Col 21, Lines 27-38 and Figure 8D). *These lines teach fields such as (equal to, minimum, maximum, etc.) which store values accordingly as shown in figure 8.* **"and a units subordinate field that identifies physical units in which physical values output for the attribute are expressed"** as (Bailey Figure 3A, reference numeral 22d). *Reference numeral 22d contains a field, which identifies the units of measure for a specific item/part/equipment.*

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teaching of the cited references because **Bailey's** teaching would have allowed **Obradovic** to provide an efficient and user-friendly graphical user interface (GUI) used for interacting with its cataloging, procurement, and other components and to provide a display of all appropriate attributes found for a specific part/item.

Claim 17 is same as claim 1 and is rejected for the same reasons as applied hereinabove.

Claim 21 is same as claim 1 except that it recites the claimed invention as an apparatus and is rejected for the same reasons as applied hereinabove.

Claim 45 is same as claim 1 except that it recites the claimed invention as a computer readable data storage medium with executable instructions and is rejected for the same reasons as applied hereinabove.

With respect to claim 4, **Obradovic** teaches **"wherein, for each attribute data record, the ID stored in the third field uniquely specifies a command such that, in response to the class of equipment stored in the first field receiving said command, said class of equipment outputs the attributes stored in the second field"** as the stress test results may be associated with the various products, the results may be mapped against product-specific test criteria, and generic commands may be translated to product-specific commands (**Obradovic** Abstract). *These lines teach that results are mapped/associated with different products and product specific commands are being used for collection of data.*

Claim 25 is same as claim 4 except that it recites the claimed invention as an apparatus and is rejected for the same reasons as applied hereinabove.

With respect to claim 5, **Obradovic** teaches **"wherein, for at least one attribute data record, the step of storing the second field further includes the step of:**

storing a fifth field identifying a position of a chamber connected to the class of equipment identified in the first field" as if the database is used with the virtual oven invention discussed above, it is advantageous to further include a virtual oven data entity storing information relating to one or more virtual ovens that may be utilized to conduct the stress test. More particularly, the process data entity may include: a process information item storing information relating to stress test process identity and test process description; a process test run data entity storing information

relating to stress test process identity, virtual oven identity and stress test process start/stop time(s); and a virtual oven data entity storing information relating to virtual oven identity, virtual oven description and virtual oven location, said process test run data entity relating said virtual oven data entity to said process information item in order to permit functional associations between virtual ovens, stress test processes, and process-test runs (**Obradovic** Paragraph 0032).

Claim 26 is same as claim 5 except that it recites the claimed invention as an apparatus and is rejected for the same reasons as applied hereinabove.

With respect to claim 18, **Obradovic** teaches **"wherein, for at least one of the attribute data records, the parameter stored in the third field specifies at least one of a range of physical values"** as the test criteria table may include a limit type information item 462 (e.g. fixed limit range, percentage range, delta range), a run limit value information item 464 (e.g. storing actual limits against which the results are tested for pass/fail according to the type of limit), a test run information item 466 (to identify the test run process, the serial number of the product being tested (**Obradovic** Paragraph 0032).

Obradovic teaches the elements of claim 18 as noted above but does not explicitly discloses **"the conversion parameter stored in the third field specifies at least one of a scale factor."**

However, **Bailey** discloses **"the conversion parameter stored in the third field specifies at least one of a scale factor"** as a part_id field may contain a unique number corresponding to each item. Thus the part_id field may be the primary key of this table. A part_number field may contain the number that the item is given from the manufacturer. *A unit_of_measure field identifies the unit of measure used to describe the item* (e.g., feet, inches, centimeters, degrees, etc.) (**Bailey** Col 13, Lines 29-48). The first seventeen items 204 have attribute values that are shown in English format and the remaining items 206 are shown in metric format. Selecting "Metric" button 200 will convert English format values to Metric, as shown in FIG. 9G. This is done by changing the conversion value in part_char table 22e from some English indicator like "in" for inches to a metric indication like "mm" for millimeters. Similarly, selecting the "English" button 202 will convert metric format values to English, as shown in FIG. 9H. This action would undo the previous change to the conversion field of part_char table 22e from "mm" to "in" (**Bailey** Col 24, Lines 10-21).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teaching of the cited references because **Bailey's** teaching would have allowed **Obradovic** to provide an efficient and user-friendly graphical user interface (GUI) used for interacting with its cataloging, procurement, and other components and to provide a display of all appropriate attributes found for a specific part/item.

Claim 52 is same as claim 18 except that it recites the claimed invention as a computer readable data storage medium with executable instructions and is rejected for the same reasons as applied hereinabove.

With respect to claim 46, **Obradovic** teaches **the method of claim 1, further comprising:**

"providing a first manufacturing equipment" as (**Obradovic** Paragraph 0015, 0061, and 0065).

"identifying a first class of equipment to which the first manufacturing equipment belongs" as (**Obradovic** Paragraph 0142, 0154).

"retrieving from the first database table one of said attribute data records and from the second database table one of said subordinate data records such that the first, second and third fields of the retrieved attribute data record respectively identify: (i) said first class of equipment, (ii) a first attribute, and (iii) a first ID" as (**Obradovic** Paragraph 0141-0144).

"using the first ID to retrieve a value of the first attribute from the first manufacturing equipment" as (**Obradovic** Paragraph 0020, 0090 and 0141-0144).

The equipments brand/ID is being used to uniquely identify each piece of test/measurements and communication equipments.

With respect to claim 47, **Obradovic** teaches t**he method of claim 4, further comprising:**

"providing a first manufacturing equipment" as (**Obradovic** Paragraph 0015, 0061, and 0065).

"identifying a first class of equipment to which the first manufacturing equipment belongs" as (**Obradovic** Paragraph 0142, 0154).

"retrieving from the database memory device one of said attribute data records and one of said subordinate data records such that the first, second and third fields of the retrieved attribute data record respectively identify: (i) said first class of equipment, (ii) a first attribute, and (iii) a first command" as (**Obradovic** Paragraph 0141-0144).

"sending the first command to the first manufacturing equipment" as (**Obradovic** Paragraph 0145-0147).

"wherein the first manufacturing equipment outputs a value of the first attribute in response to sending the first command" as (**Obradovic** Paragraph 0020, 0090 and 0146-0147).

The measurements values are being received and stored in response to the commands sent by use of different protocol to the modules under test.

With respect to claim 48, **Obradovic** teaches **the method of claim 1, further comprising:**

"providing a first manufacturing equipment having a plurality of physical communications interfaces for outputting attribute data" as (**Obradovic** Paragraph 0141, 0080, 0107).

"identifying a first class of equipment to which the first manufacturing equipment belongs" as (**Obradovic** Paragraph 0142, 0154).

"retrieving from the database memory device one of said attribute data records and one of said subordinate data records such that the first, second and third fields of the retrieved attribute data record respectively identify: (i) said first class of equipment, (ii) a first attribute, and (iii) a first ID that identifies a first one of said physical communications interfaces" as (**Obradovic** Paragraph 0141-0144).

"receiving a value of the first attribute from the first physical communications interface" as (**Obradovic** Paragraph 0141, 0080, 0107).

These paragraphs teach that database 400 is specifying/providing appropriate protocols and interfaces such as GPIB, Ethernet, and RS232 for different equipments to receive measurements values.

With respect to claim 49, **Obradovic** teaches **the method of claim 1, further comprising:**

"providing a first manufacturing equipment having a plurality of signal lines for outputting attribute data" as (**Obradovic** Paragraph 0090 and figure 5).

"identifying a first class of equipment to which the first manufacturing equipment belongs" as (**Obradovic** Paragraph 0142, 0154).

"retrieving from the database memory device one of said attribute data records and one of said subordinate data records such that the first, second and third fields of the retrieved attribute data record respectively identify: (i) said first

class of equipment, (ii) a first attribute, and (iii) a first ID that identifies a first address transmitted by the first manufacturing equipment when it transmits the first attribute" as (**Obradovic** Paragraph 0141-0144 and 0153).

"receiving attribute data from the first manufacturing equipment" as (**Obradovic** Paragraph 0145-0147).

"using the first ID to locate a value of the first attribute within the attribute data received from the first manufacturing equipment" as (**Obradovic** Paragraph 0141-0144 and 0153).

These paragraphs teach that test criteria table includes test run information which identifies the test run process, the serial number of the product being tested and the slot ID specifies ones of the multiple slots used for the testing purposes. The slot information further specifies equipments rack and shelf in which the slot is found. Therefore the examiner interprets the slot ID as identifying the address of the equipment being tested.

With respect to claim 50, **Obradovic** teaches **the method of claim 1, further comprising:**

"providing a first manufacturing equipment having a plurality of signal lines for outputting attribute data" as (**Obradovic** Paragraph 0090 and figure 5).

"identifying a first class of equipment to which the first manufacturing equipment belongs" as (**Obradovic** Paragraph 0142, 0154).

"retrieving from the database memory device one of said attribute data records and one of said subordinate data records such that the first, second and third fields of the retrieved attribute data record respectively identify: (i) said first class of equipment, (ii) a first attribute, and (iii) a first ID that identifies a first offset that specifies a position of the first attribute within a frame of data transmitted by the first manufacturing equipment" as (**Obradovic** Paragraph 0141-0144 and 0153, 0032).

"receiving attribute data from the first manufacturing equipment" as (**Obradovic** Paragraph 0145-0147).

"using the first offset to locate a value of the first attribute within the attribute data received from the first manufacturing equipment" as (**Obradovic** Paragraph 0141-0144 and 0153, 0032).

These paragraphs teach that test criteria table includes test run information which identifies the test run process, the serial number of the product being tested and the slot ID specifies ones of the multiple slots used for the testing purposes. The slot information further specifies equipments rack and shelf in which the slot is found. Therefore the examiner interprets the slot ID as an offset which identifies the position/address of the equipment being tested from where the first attribute is being transmitted.

With respect to claim 51, **Obradovic** teaches **"wherein the one or more subordinate fields include at least one of an attribute name field, an attribute**

chamber model field and a read/write field" as (**Obradovic** Paragraphs 0144, 0151, 0032).

With respect to claim 56, **Obradovic** teaches **"storing in a third database table that is a child table of the first database table a plurality of additional subordinate data records, wherein storing each additional subordinate data record includes: storing in the subordinate data record one or more subordinate fields that are subordinate to the second field of an attribute data record, the one or more subordinate fields including at least one of a chamber position subordinate field or a chamber model subordinate field"** as (**Obradovic** Paragraph 0032). In this paragraph examiner interprets process table as the third table further storing information relating to the oven identity and the location of the oven. Examiner interprets the location of the oven as the chamber position.

3. Claims 6, 8-9, 27 and 29-30 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Obradovic et al.** (U.S. PG Pub No. 2002/0107581 A1), in view of **Bailey et al.** (U.S. Patent No 6,820,076) as applied to claims 1, 4, 5, 17-18, 21, 25-26, 45-52, and 56 above, in view of **Robert C. Beauchesne** (**Beauchesne** hereinafter) (U.S. Patent No 5,777,876).

With respect to claim 6, **Obradovic** teaches equipments brand, model and release but does not explicitly teaches **"wherein, for each attribute data record, the first field identifies at least one model of equipment and a version of equipment."**

However, **Beauchesne** teaches **"wherein, for each attribute data record, the first field identifies at least one model of equipment and a version of equipment"** as the product main *fields also includes a 4 digit product version field* for storing information coded value specifying the manufacturing version of the board indicating the particular assembly line (equipment complement) on which the board will be manufactured (e.g. A, B). A Generic name field is used for storing information which may describe the product in generic terms and this is especially useful in situations where a particular product is associated *with a specific model or feature name*: Taurus, Legend, etc (**Beauchesne** Col 5, Lines 62-67).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teaching of the cited references because **Beauchesne's** teaching would have allowed **Obradovic and Bailey** to manage and control process information pertaining to a variety of different equipments manufactured on a number of different manufacturing lines (**Beauchesne** Col 1, Lines 66-67 & Col 2, Lies 1-2) by having different versions of an equipment.

Claim 27 is same as claim 6 except that it recites the claimed invention as an apparatus and is rejected for the same reasons as applied hereinabove.

With respect to claim 8, **Obradovic** teaches equipments brand, model and release but does not explicitly teaches, **"storing a first subordinate field that identifies a model of equipment" and "storing a second subordinate field that identifies a version of the model of equipment identified in the first subordinate field."**

However, **Beauchesne** discloses **"storing a first subordinate field that identifies a model of equipment" and "storing a second subordinate field that identifies a version of the model of equipment identified in the first subordinate field"** as the product main *fields also includes a 4 digit product version field* for storing information coded value specifying the manufacturing version of the board indicating the particular assembly line (equipment complement) on which the board will be manufactured (e.g. A, B). A *Generic name field* is used for storing information which may describe the product in generic terms and this is especially useful in situations where a particular product is associated *with a specific model or feature name*: Taurus, Legend, etc (**Beauchesne** Col 5, Lines 62-67).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teaching of the cited references because **Beauchesne's** teaching would have allowed **Obradovic and Bailey** to manage and control process information pertaining to a variety of different equipments manufactured on a number of different manufacturing lines (**Beauchesne** Col 1, Lines 66-67 & Col 2, Lies 1-2) by having different versions of an equipment.

Claim 29 is same as claim 8 except that it recites the claimed invention as an apparatus and is rejected for the same reasons as applied hereinabove.

With respect to claim 9, **Obradovic and Bailey** do not explicitly teach **"wherein, for at least one attribute data record, storing the first field includes: storing first and second subordinate fields that collectively identify at least one of a range of versions of an equipment model and a range of revision dates of the equipment model."**

However, **Beauchesne** discloses **"storing first and second subordinate fields that collectively identify at least one of a range of versions of an equipment model and a range of revision dates of the equipment model"** as other fields include *a 10 digit current revision field, a 10 digit previous revision field*, a 40 digit comment text field, a 8 digit source locating field and a *12 digit file date field*. The revision field is used for storing a coded value designating the most recent revision made to any of the steps associated with the product. The previous revision field is used for storing a coded value designating the previous change (**Beauchesne** Col 6, Lines 12-19 and figure 2b). Different revisions give different versions. Therefore the range of revisions gives the range of versions.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teaching of the cited references because **Beauchesne's** teaching would have allowed **Obradovic and Bailey** to manage and control process information pertaining to a variety of different equipments manufactured

on a number of different manufacturing lines (**Beauchesne** Col 1, Lines 66-67 & Col 2, Lies 1-2) by having different versions of an equipment.

Claim 30 is same as claim 9 except that it recites the claimed invention as an apparatus and is rejected for the same reasons as applied hereinabove.

4. Claims 15 and 36 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Obradovic et al.** (U.S. PG Pub No. 2002/0107581 A1), in view of **Bailey et al.** (U.S. Patent No 6,820,076) as applied to claims 1, 4, 5, 17-18, 21, 25-26, 45-52, and 56 above, in view of **Guillermo Rudolfo Chacon** (**Chacon** hereinafter) (U.S. Patent No. 6,128,588).

With respect to claim 15, **Obradovic and Bailey** do not explicitly teach **"the attribute identified in the step of storing the first second field is a measurement of a process being performed in a semiconductor fabrication process chamber and an operating condition of a process being performed in a semiconductor fabrication process chamber."**

However, **Chacon** teaches **"the attribute identified in the step of storing the first second field is a measurement of a process being performed in a semiconductor fabrication process chamber and an operating condition of a process being performed in a semiconductor fabrication process chamber"** as wafer fabrication, for example, involves complex dynamic production systems. The

measurement of their capacity and performance such as lead-time and wafer output are not accurate enough if a solution capable of modeling the dynamic fabrication conditions and variance in the system is not used (**Chacon** Col 1, Lines 47-52). The present invention relates to an integrated characterization and scheduling system for fabrication production systems such as wafer fabrication. In particular, the present invention is directed to a machine tact (time standard) modeling system for use with a manufacturing execution system. According to the present invention, a method and system for creating customized machine tact information includes defining time standards as a function of process parameter and equipment parameters. For example, if a process parameter such as temperature, pressure, etc. and an equipment parameter such as equipment brand name, model, etc. are entered, the system creates and suggests the time standard to use for those times that are not likely to have large variations (**Chacon** Col 2, Lines 17-31).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teaching of the cited references because **Chacon's** teaching would have allowed **Obradovic and Bailey** to provide a production model that achieves desired fabrication performance measures such as wafer output and reduced cycle time by allowing a user to create and mange production models by use of a graphical user interface.

Claim 36 is same as claim 15 except that it recites the claimed invention as an apparatus and is rejected for the same reasons as applied hereinabove.

5. Claim 44 is rejected under 35 U.S.C. 103(a) as being unpatentable over **Obradovic et al.** (U.S. PG Pub No. 2002/0107581 A1), in view of **Mchale et al.** (**Mchale** hereinafter) (U.S. PG Pub No 2001/0043568).

With respect to claim 44, **Obradovic** teaches **a computer-readable data storage medium in which is stored instructions executable by a computer to perform a method for storing database records in a data storage device, wherein:**

"the method comprises storing in a data storage device a plurality of attribute data records and a plurality of subordinate data records" as the stress-test database may further include: a parsing table storing information relating to parsing of equipment-specific data received as a result of the stress test; said parsing table being associated with said equipment data entity to permit the equipment-specific data to be parsed into a more consistent format suitable for storage by said result data entity (**Obradovic** Paragraph 0031 and Figure 4).

Examiner interprets the storage of equipment specific data as storage of attribute and subordinate data records. This equipment specific data is being stored on the storage device storing the database 40.

"said storing each attribute data record includes: storing in that record a first field identifying a class of equipment," as the equipment table 520 may include the following information items or fields: equipment brand identifier, equipment brand name, equipment type identifier, equipment type description and other information items

that are used to uniquely identify each piece of test and communication equipment (**Obradovic** Paragraph 0142).

Examiner interprets equipment brand and type as identifying class of equipment.

"wherein at least one class of equipment is manufacturing equipment having a plurality of physical communications interfaces for outputting attribute data formatted according to a plurality of communications protocols, the plurality of communications protocols including, at least a command-driven digital communications protocol" as the equipment command & communication table 500 permits the AMS controller 100 to send commands to, receive data from and otherwise communicate with various different types of test and communication equipment including the variety of test equipment 25 and *the respective communication interface equipment (e.g. the communication server 55, Ethernet box 70, etc.). Each type of test and communication equipment may expect a different protocol, command, syntax, line rate, etc depending upon the equipment brand, model, release, etc*. One of the key advantages of the inventive system is the ability to easily communicate with any such equipment and the database 400 *facilitates such communication by providing the appropriate protocols, syntax, commands, etc for the particular type of equipment being utilized* (**Obradovic** Paragraph 0141, 0080, 0107).

This invention is directed toward stress testing of the manufacturing flow for the producing reliable modules. Therefore examiner interprets the modules as being the manufacturing equipment. Paragraph 0141 discloses communication interface equipment (e.g. the communication server 55, Ethernet box 70, etc.). Further

paragraphs 0080 and 0107 teach connections and protocols such as GPIB, Ethernet and RS232 that are used for outputting/routing measurements as desired.

Applicant also describes communication interfaces as conventional RS-232 serial port or a conventional Ethernet port on page 5, lines 13-18 of specification.

"storing in that record a second field identifying an attribute whose value is outputted by the class of equipment identified by the first field of that record," as the modules may also include sensors or other devices for measuring parameters of the module and the controller may receive passive test measurement values from these sensors. In this way, a passive test of the modules may be performed independently of and simultaneous with the active testing. The results of the active test and the passive test measurement values for each of the modules are associated with the module and stored in a database (**Obradovic** Paragraph 0020).

Examiner interprets the sensor measurements associated with the module/equipment as the outputted value and is being stored in a database.

"storing in that record a third field specifying a communications protocol and a physical communications interface that is used for the attribute identified by the second field of that record, wherein the data storage device includes a separate record for each of the plurality of physical communications interfaces of the at least one class of equipment" as table 500 may also be used to communicate with a variety of modules 15 under test. As mentioned above, some of the testing regimes may require sending commands to the modules 15 under test to, for example, place them in a particular mode or operational state. If a variety of modules 15 are

being tested having different protocols, syntax, commands, etc then utilizing the table 500 would simplify sending commands to and receiving data from such modules 15 (**Obradovic** Paragraph 0146). The database 400 facilitates such communication by providing the appropriate protocols, syntax, commands, etc for the particular type of equipment being utilized (**Obradovic** Paragraph 0141 and 0080).

These paragraphs teach that database 400 is specifying/providing appropriate protocols and interfaces such as GPIB, Ethernet, and RS232 for different equipments and further specifies that any other types of connections and protocol are also incorporated herein. Therefore examiner interprets database 400 containing record for communication interfaces because database 400 is specifying/providing appropriate protocols and interfaces for different equipments.

"storing in that record a fourth field specifying an ID which the class of equipment identified by the first field of that record assigns to the attribute value identified by the second field of that record, wherein the ID identifies a first one of the plurality of physical communication interfaces" as the equipment table 520 may include the following data entities: a equipment brand data entity 522, equipment type data entity 524 (optional particularly if the each brand has only one type), and the equipment usage data entity 526 each of which may include fields for ID, name and description (e.g. brand data entity 522 has an equipment brand ID which may be used as a key, equipment brand name and equipment brand description fields). Equipment brand entity 522 is associated with equipment type data entity 524 in order to positively identify the equipment (**Obradovic** Paragraph 0144). The passive test measurements

or results thereof are supplied by the modules 15 to the AMS controller 100 as indicated by the signal line connecting these elements. The AMS controller associates the test measurement and/or results with the particular module 15 being passively tested and supplies this data to the database 40 (**Obradovic** Paragraph 0090 and 0080).

Examiner interprets the field for equipment brand ID as the claimed ID of class of equipment and the communication interfaces are being identified based on their connection to the modules under test, wherein the connection identifies the ID of the class of equipment.

"said storing each subordinate attribute data record includes:

storing in the subordinate data record one or more subordinate fields that are subordinate to the second field of an attribute data record" as the design of database 400 includes four main data entities: the product table 410, the result table 430, the process table 450, and the equipment command & communication table 500. The major data associations relate the product table 410 to the result table 430; and the result table 430 to the process table 450; and the result table 430 to the equipment command & communication table 500 (**Obradovic** Paragraph 0137). The result table 430 may include the following data entities: result format data entity 432, result value data entity 434 and process-result value data entity 436. The result format data entity 432 stores result formatting and processing information such as result ID, result description, max decimal digits, sort order, etc. The result value 434 stores the actual test result value, a pass/fail result, test run ID, and result ID (**Obradovic** Paragraph 0148).

Examiner interprets the result table containing result ID, result description, max decimal digits, sort order etc. as one or more subordinate fields.

"wherein the first field, second field, third field, fourth field and one or more subordinate fields, in combination, define communications interface specifications that enable a diagnostic apparatus to retrieve distinct attribute information from distinct classes of equipment" as the equipment command & communication table 500 permits the AMS controller 100 to send commands to, receive data from and otherwise communicate with various different types of test and communication equipment including the variety of test equipment 25 and the respective communication interface equipment (e.g. the communication server 55, Ethernet box 70, etc.). Each type of test and communication equipment may expect a different protocol, command, syntax, line rate, etc depending upon the equipment brand, model, release, etc. One of the key advantages of the inventive system is the ability to easily communicate with any such equipment and the database 400 facilitates such communication by providing the appropriate protocols, syntax, commands, etc for the particular type of equipment being utilized (**Obradovic** Paragraph 0141).

These lines teach that appropriate commands, protocols are being sent by the controller to retrieve data from various different kinds of equipment by using communication equipments and the respective communication interface equipments.

Obradovic teaches the elements of claim 44 as noted above but does not explicitly teaches **"an analog communication protocol and a continuous streaming digital communication protocol."**

However, **Mchale** discloses **"an analog communication protocol and a continuous streaming digital communication protocol"** as a selected subset of data lines 54 to output lines 72 in response to signals received from controller 80 using link 84. Each of the output lines 72 is coupled to an associated modem 160 which translates the information formatted in an *analog communication protocol*, such as XDSL, into an appropriate digital signal (**Mchale** Paragraph 0095). As shown, the communication server of FIGS. 18A and 18B includes *a plurality of line interface modules (LIMs)* 750 and a plurality of ADSL transceiver units 752 interconnected by dual analog buses 754. ADSL transceiver units 752 are connected to serial buses 756. Each line interface module 750 includes intra-office protection circuits 758, hybrid circuits 760, switch 762 and detect circuit 764 (**Mchale** Paragraph 0095). These frames or packets could be Ethernet, ATM, HDLC, or any suitable data communications frame format. The off-hook detector in communication server 58 could also examine various protocols such as TCP/IP, PPP, or any other suitable network protocol or data stream (**Mchale** Paragraph 0056).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teaching of the cited references because **Mchale's** teaching would have allowed **Obradovic** to provide efficient communication by employing digital or analog communication protocols on the data lines and further by using the analog/digital converter to convert the signals to a digital signal.

6. Claims 53-55 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Obradovic et al.** (U.S. PG Pub No. 2002/0107581 A1), in view of **Bailey et al.** (U.S. Patent No 6,820,076) as applied to claims 1, 4, 5, 17-18, 21, 25-26, 45-52, and 56 above further in view of **Mchale et al. (Mchale** hereinafter) (U.S. PG Pub No 2001/0043568).

With respect to claims 53 and 54, **Obradovic** teaches **"storing a first attribute data record includes storing first values of the first field, second field, third field, a fourth field and one or more subordinate fields that enable the diagnostic apparatus to communicate with a first class of equipment via a command-driven protocol" and "storing a second attribute data record includes storing second values of the first field, second field, third field, fourth field and one or more subordinate fields that enable the diagnostic apparatus to communicate with a second class of equipment via a digital interface"** as the equipment command & communication table 500 permits the AMS controller 100 to send commands to, receive data from and otherwise communicate with various different types of test and communication equipment including the variety of test equipment 25 and the respective communication interface equipment (e.g. the communication server 55, Ethernet box 70, etc.). Each type of test and communication equipment may expect a different protocol, command, syntax, line rate, etc depending upon the equipment brand, model, release, etc. One of the key advantages of the inventive system is the ability to easily communicate with any such equipment and the database 400 facilitates such

communication by providing the appropriate protocols, syntax, commands, etc for the particular type of equipment being utilized **(Obradovic** Paragraph 0141, 0080, 0107).

Paragraph 0141 discloses communication interface equipment (e.g. the communication server 55, Ethernet box 70, etc.). Further paragraphs 0080 and 0107 teach connections and protocols such as GPIB, Ethernet and RS232 that are used for outputting/routing measurements as desired.

Examiner interprets database 400 containing record for communication interfaces because database 400 is specifying/providing appropriate protocols and interfaces for different equipments.

Applicant also describes communication interfaces as conventional RS-232 serial port or a conventional Ethernet port on page 5, lines 13-18 of specification.

Obradovic teaches elements of claims 53 and 54 as noted above but does not explicitly teaches **"storing a second attribute data record includes storing second values of the first field, second field, third field, fourth field and one or more subordinate fields that enable the diagnostic apparatus to communicate with a second class of equipment via a continuous streaming protocol" and "storing a first attribute data record includes storing first values of the first field, second field, third field, a fourth field and one or more subordinate fields that enable the diagnostic apparatus to communicate with a first class of equipment via a analog interface."**

However, **Mchale** discloses **"storing a second attribute data record includes storing second values of the first field, second field, third field, fourth field and**

one or more subordinate fields that enable the diagnostic apparatus to communicate with a second class of equipment via a continuous streaming protocol" and "storing a first attribute data record includes storing first values of the first field, second field, third field, a fourth field and one or more subordinate fields that enable the diagnostic apparatus to communicate with a first class of equipment via a analog interface" as a selected subset of data lines 54 to output lines 72 in response to signals received from controller 80 using link 84. Each of the output lines 72 is coupled to an associated modem 160 which translates the information formatted in an *analog communication protocol*, such as XDSL, into an appropriate digital signal (**Mchale** Paragraph 0095). As shown, the communication server of FIGS. 18A and 18B includes *a plurality of line interface modules (LIMs)* 750 and a plurality of ADSL transceiver units 752 interconnected by dual analog buses 754. ADSL transceiver units 752 are connected to serial buses 756. Each line interface module 750 includes intra-office protection circuits 758, hybrid circuits 760, switch 762 and detect circuit 764 (**Mchale** Paragraph 0095). These frames or packets could be Ethernet, ATM, HDLC, or any suitable data communications frame format. The off-hook detector in communication server 58 could also examine various protocols such as TCP/IP, PPP, or any other suitable network protocol or data stream (**Mchale** Paragraph 0056).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teaching of the cited references because **Mchale's** teaching would have allowed **Obradovic and Bailey** to provide efficient communication

by employing digital or analog communication protocols on the data lines and further by using the analog/digital converter to convert the signals to a digital signal.

With respect to claim 55, **Obradovic** teaches **"wherein at least one class of equipment is manufacturing equipment having a plurality of physical communications interfaces for outputting attribute data formatted according to a plurality of communications protocols, the plurality of communications protocols including, at least a command-driven digital communications protocol"** as the equipment command & communication table 500 permits the AMS controller 100 to send commands to, receive data from and otherwise communicate with various different types of test and communication equipment including the variety of test equipment 25 and the respective communication interface equipment (e.g. the communication server 55, Ethernet box 70, etc.). Each type of test and communication equipment may expect a different protocol, command, syntax, line rate, etc depending upon the equipment brand, model, release, etc. One of the key advantages of the inventive system is the ability to easily communicate with any such equipment and the database 400 facilitates such communication by providing the appropriate protocols, syntax, commands, etc for the particular type of equipment being utilized (**Obradovic** Paragraph 0141, 0080, 0107).

This invention is directed toward stress testing of the manufacturing flow for the producing reliable modules. Therefore examiner interprets the modules as being the manufacturing equipment. Paragraph 0141 discloses communication interface

equipment (e.g. the communication server 55, Ethernet box 70, etc.). Further paragraphs 0080 and 0107 teach connections and protocols such as GPIB, Ethernet and RS232 that are used for outputting/routing measurements as desired.

Applicant also describes communication interfaces as conventional RS-232 serial port or a conventional Ethernet port on page 5, lines 13-18 of specification.

"storing in the record a third field specifying a communications protocol and a physical communications interface that is used for the attribute identified by the second field of that record, wherein the data storage device includes a separate record for each of the plurality of physical communications interfaces of the at least one class of equipment" as table 500 may also be used to communicate with a variety of modules 15 under test. As mentioned above, some of the testing regimes may require sending commands to the modules 15 under test to, for example, place them in a particular mode or operational state. If a variety of modules 15 are being tested having different protocols, syntax, commands, etc then utilizing the table 500 would simplify sending commands to and receiving data from such modules 15 (**Obradovic** Paragraph 0146). The database 400 facilitates such communication by providing the appropriate protocols, syntax, commands, etc for the particular type of equipment being utilized (**Obradovic** Paragraph 0141 and 0080).

These paragraphs teach that database 400 is specifying/providing appropriate protocols and interfaces such as GPIB, Ethernet, and RS232 for different equipments and further specifies that any other types of connections and protocol are also incorporated herein. Therefore examiner interprets database 400 containing record for

communication interfaces because database 400 is specifying/providing appropriate protocols and interfaces for different equipments.

Obradovic teaches the elements of claim 55 as noted above but does not explicitly teach **"an analog communication protocol and a continuous streaming digital communication protocol."**

However, **Mchale** discloses **"an analog communication protocol and a continuous streaming digital communication protocol"** as a selected subset of data lines 54 to output lines 72 in response to signals received from controller 80 using link 84. Each of the output lines 72 is coupled to an associated modem 160 which translates the information formatted in an *analog communication protocol*, such as XDSL, into an appropriate digital signal (**Mchale** Paragraph 0095). As shown, the communication server of FIGS. 18A and 18B includes *a plurality of line interface modules (LIMs)* 750 and a plurality of ADSL transceiver units 752 interconnected by dual analog buses 754. ADSL transceiver units 752 are connected to serial buses 756. Each line interface module 750 includes intra-office protection circuits 758, hybrid circuits 760, switch 762 and detect circuit 764 (**Mchale** Paragraph 0095). These frames or packets could be Ethernet, ATM, HDLC, or any suitable data communications frame format. The off-hook detector in communication server 58 could also examine various protocols such as TCP/IP, PPP, or any other suitable network protocol or data stream (**Mchale** Paragraph 0056).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teaching of the cited references because **Mchale's**

teaching would have allowed **Obradovic and Bailey** to provide efficient communication by employing digital or analog communication protocols on the data lines and further by using the analog/digital converter to convert the signals to a digital signal.

Response to Arguments

7. Applicant's arguments filed 01/19/2010 have been fully considered but they are not persuasive.

Applicant argues that **Obradovic and Bailey** do not teaches or suggest **"storing in that record a third field specifying an ID which the class of equipment identified by the first field of that record assigns to the attribute identified by the second field of that record."**

In response to the preceding arguments examiner respectfully submits that **Obradovic** teaches **"storing in that record a third field specifying an ID which the class of equipment identified by the first field of that record assigns to the attribute identified by the second field of that record"** as the equipment table 520 may include the following data entities: a equipment brand data entity 522, equipment type data entity 524 (optional particularly if the each brand has only one type), and the equipment usage data entity 526 each of which may include fields for ID, name and description (e.g. brand data entity 522 has an equipment brand ID which may be used as a key, equipment brand name and equipment brand description fields). Equipment

brand entity 522 is associated with equipment type data entity 524 in order to positively identify the equipment (**Obradovic** Paragraph 0144, 0154).

Examiner interprets the field for equipment brand ID as the claimed ID of class of equipment.

These lines teach equipment brand entity, which has an equipment brand ID and may be used as a key, is associated with equipment type data entity in order to identify the equipment and associates the outputted results to the equipment being tested.

Applicant further argues that **Obradovic and Bailey** do not teaches or suggest **"a forth field specifying conversion parameters that define a conversion of the value of the attribute identified in the second field into physical units of measurement"** and states that Bailey is silent on the existence of values of attributes outputted by certain class of equipment.

First, examiner would like to point out that examiner has relied on **Obradovic** to teaches **"values of attributes outputted by certain class of equipment"** as (**Obradovic** Paragraph 0020). *These lines teach sensor measurements associated with the module/equipment are being stored in a database.*

In response to the preceding arguments examiner respectfully submits that **Bailey** teaches **"specifying conversion parameters that define a conversion of the value of the attribute identified in the second field into physical units of measurement"** as a part_id field may contain a unique number corresponding to each item. Thus the part_id field may be the primary key of this table. A part_number field

may contain the number that the item is given from the manufacturer. *A unit of measure field identifies the unit of measure used to describe the item* (e.g., feet, inches, centimeters, degrees, etc.) (**Bailey** Col 13, Lines 29-48). The first seventeen items 204 have attribute values that are shown in English format and the remaining items 206 are shown in metric format. Selecting "Metric" button 200 will convert English format values to Metric, as shown in FIG. 9G. This is done by changing the conversion value in part_char table 22e from some English indicator like "in" for inches to a metric indication like "mm" for millimeters. Similarly, selecting the "English" button 202 will convert metric format values to English, as shown in FIG. 9H. This action would undo the previous change to the conversion field of part_char table 22e from "mm" to "in" (**Bailey** Col 24, Lines 10-21).

Therefore these lines teach storing units of measurement (such as feet, inches, degrees, etc) for different items/parts which could further be converted from English format to Metric format or vice versa.

Therefore the combination of Obradovic and Bailey teaches the claimed invention as a whole.

Claims must be given the broadest reasonable interpretation during examination and limitations appearing in the specification but not recited in the claims are not read into the claim (See M.P.E.P. 2111 [R-I]).

Conclusion

8. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Contact Information

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to USMAAN SAEED whose telephone number is (571)272-4046. The examiner can normally be reached on M-F 8-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hosain Alam can be reached on (571)272-3978. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Usmaan Saeed
Patent Examiner, Art Unit: 2166
April 5, 2010

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